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Study of Atmospheric Effects in SKYLAB Data
Seventh Quarterly Progress Report

EREP Investigation 410 M
NASA Contract NAS9-13272

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SKYLAB S-192 data will be processed to verify the performance calculated by the model for the atmospheric case appropriate to the SKYLAB data acquisition conditions in August 1973.

PLANS

Processing of aircraft data and exercise of the Turner model will take place during the next quarter. When SKYLAB S-192 tapes arrive, they will be processed according to the plans outlined above.

TRAVEL

None

REFERENCES

1. William Malila and Richard Nalepka, "Advanced Processing and Information Extraction Techniques," Paper No. 15, Third Earth Resources Technology Satellite-1 Symposium, p. 1743, NASA SP-351, December 1973.

Respectfully submitted:

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Study of Atmospheric Effects in SKYLAB Data Seventh Quarterly Progress Report

This report covers progress during the seventh quarter (1 September - 30 November 1974) of contract NAS9-13272, "Study of Atmospheric Effects in SKYLAB Data," EREP No. 410 M. The work is being conducted in the Infrared and Optics Division of the Environmental Research Institute of Michigan, under the general supervision of Mr. R. R. Legault. The principal investigator is Mr. F. J. Thomson.

PROGRESS

Toward the end of the quarter, the processing of aircraft data resumed following a reassessment of the relative amounts of resources required to complete the aircraft and SKYLAB data processing and a letter from the contracting officer specifying a delivery date for S-192 data. Further, a proposal was submitted to JSC, in response to a letter from the contracting officer, requesting additional funds for completion of the technical effort.

The goal of processing the aircraft data will be to extract calibrated reflectance signatures from typical Michigan crops. To realistically portray what the S-192 sensor would see with no atmosphere intervening, the aircraft data will first be smoothed to an effective 80m resolution. Then radiance signatures for crops will be extracted and these radiance signatures calibrated to reflectance through the use of reflectance panels and secondary reflectance standards.

Various atmospheric conditions will be simulated by modifying the reflectance signatures. Modifications caused by varying atmospheric visibilities and by varying base elevations will be calculated using the atmospheric model developed by R. Turner at ERIM [1]. An atmospheric state corresponding to the SKYLAB overpass condition will be simulated.

Investigation of the effects of varying atmospheric state on pattern recognition accuracy will be assessed using a model of the linear classifier. The model is currently being developed.